WHAT IS CLAIMED IS:

1. A transmitter for transmitting complex symbols in a wireless communication system, comprising:

four transmitting antennas; and

an encoder for configuring four combinations for four input symbols so that a sequence of four symbols can be transmitted once by each antenna during each time interval, and for transferring the combinations to the transmitting antennas,

wherein at least two symbols selected from the four input symbols are each rotated by predetermined phase values.

2. The transmitter as set forth in claim 1, wherein the number of the selected symbols is 2, and the selected symbols are associated with different metrics when a receiver carries out a decoding operation.

3. The transmitter as set forth in claim 1, wherein the phase values are within a range of 21° to 69° with a center of 45° where QPSK (Quadrature Phase Shift Keying) is used.

4. The transmitter as set forth in claim 1, wherein the phase values are within a range of 21° to 24° where 8PSK (8-ary Phase Shift Keying) is used.

5. The transmitter as set forth in claim 1, wherein the phase values are 11.25° where 16PSK (16-ary Phase Shift Keying) is used.

6. The transmitter as set forth in claim 1, wherein the encoder carries

out negate and conjugate operations and configures the four combinations so that at least some sequences of four symbol sequences to be transferred to the respective antennas during four time intervals are orthogonal to each other.

7. The transmitter as set forth in claim 6, wherein the four combinations configured by the four input symbols form a matrix consisting of four rows and four columns, the matrix being given by:

$$\begin{bmatrix} e^{j\theta_1}s_1 & s_2 & s_3^* & e^{-j\theta_4}s_4^* \\ s_2^* & -e^{-j\theta_1}s_1^* & e^{j\theta_4}s_4 & -s_3 \\ s_3 & e^{j\theta_4}s_4 & -e^{-j\theta_1}s_1^* & -s_2^* \\ e^{-j\theta_4}s_4^* & -s_3^* & -s_2 & e^{j\theta_1}s_1 \end{bmatrix}$$

where s_1, s_2, s_3 and s_4 denote the input symbols, and θ_1 and θ_4 denote phase rotation values for the symbols s_1 and s_4, respectively.

8. The transmitter as set forth in claim 6, wherein the four combinations configured by the four input symbols form a matrix consisting of four rows and four columns, the matrix being given by:

$$\begin{bmatrix} x_1 & x_2 & x_3^* & x_4^* \\ x_2^* & -x_1^* & x_4 & -x_3 \\ x_3 & x_4 & -x_1^* & -x_2^* \\ x_4^* & -x_3^* & -x_2 & x_1 \end{bmatrix} \begin{bmatrix} x_1 & x_2 & x_3^* & -x_4^* \\ x_2^* & -x_1^* & x_4 & x_3 \\ x_3 & x_4 & -x_1^* & x_2^* \\ x_4^* & -x_3^* & -x_2 & -x_1 \end{bmatrix} \begin{bmatrix} x_1 & x_2 & x_3^* & -x_4^* \\ x_2^* & -x_1^* & -x_4 & -x_3 \\ x_3 & x_4 & -x_1^* & x_2^* \\ x_4^* & -x_3^* & x_2 & x_1 \end{bmatrix}$$

$$\begin{bmatrix} x_1 & x_2 & x_3^* & x_4^* \\ x_2^* & -x_1^* & -x_4 & x_3 \\ x_3 & x_4 & -x_1^* & -x_2^* \\ x_4^* & -x_3^* & x_2 & -x_1 \end{bmatrix} \begin{bmatrix} x_1 & x_2 & -x_3^* & -x_4^* \\ x_2^* & -x_1^* & x_4 & -x_3 \\ x_3 & x_4 & x_1^* & x_2^* \\ x_4^* & -x_3^* & -x_2 & x_1 \end{bmatrix} \begin{bmatrix} x_1 & x_2 & -x_3^* & x_4^* \\ x_2^* & -x_1^* & x_4 & x_3 \\ x_3 & x_4 & x_1^* & -x_2^* \\ x_4^* & -x_3^* & -x_2 & -x_1 \end{bmatrix}$$

$$\begin{bmatrix} x_1 & x_2 & -x_3^* & -x_4^* \\ x_2^* & -x_1^* & -x_4 & x_3 \\ x_3 & x_4 & x_1^* & x_2^* \\ x_4^* & -x_3^* & x_2 & -x_1 \end{bmatrix} \begin{bmatrix} x_1 & x_2 & -x_3^* & x_4^* \\ x_2^* & -x_1^* & -x_4 & -x_3 \\ x_3 & x_4 & x_1^* & -x_2^* \\ x_4^* & -x_3^* & x_2 & x_1 \end{bmatrix}$$

where x_1, x_2, x_3 and x_4 denote four symbols containing two phase-rotated symbols.

9. The transmitter as set forth in claim 6, wherein the four combinations configured by the four input symbols form a matrix consisting of four rows and four columns, the matrix being given by:

$$\begin{bmatrix} e^{j\theta_1}s_1 & e^{j\theta_2}s_2 & e^{-j\theta_3}s_3^* & e^{-j\theta_4}s_4^* \\ e^{-j\theta_2}s_2^* & -e^{-j\theta_1}s_1^* & e^{j\theta_4}s_4 & -e^{j\theta_3}s_3 \\ e^{j\theta_3}s_3 & e^{j\theta_4}s_4 & -e^{-j\theta_1}s_1^* & -e^{-j\theta_2}s_2^* \\ e^{-j\theta_4}s_4^* & -e^{-j\theta_3}s_3^* & -e^{j\theta_2}s_2 & e^{j\theta_1}s_1 \end{bmatrix}$$

where s_1, s_2, s_3 and s_4 denote the input symbols, and θ_1 and θ_4 denote phase rotation values for the symbols s_1, s_2, s_3, and s_4, respectively.

10. A receiver for receiving complex symbols in a wireless communication system, comprising:

a symbol arranger for receiving signals transmitted from four transmitting antennas to at least one receiving antenna during four time intervals;

a channel estimator for estimating four channel gains indicating gains of channels from the four transmitting antennas to the at least one receiving antenna;

first and second decoders each producing metric values associated with all possible symbol sub-combinations using the channel gains and the signals received by the symbol arranger and detecting two symbols having a minimum metric value, each of the symbol sub-combinations containing two symbols; and

a parallel-to-serial converter for sequentially arranging and outputting the two symbols detected by each of the first and second decoders.

11. The receiver as set forth in claim 10, wherein each of the first and

second decoders comprises:

a symbol generator for generating all possible symbol sub-combinations, each of the symbol sub-combinations containing the two symbols;

a phase rotator for rotating one symbol selected from the two symbols by a predetermined phase value;

a metric calculator for producing the metric values for the symbol sub-combinations containing the phase-rotated symbol using the signals received by the symbol arranger and the channel gains; and

a detector for detecting the two symbols having the minimum metric value using the produced metric values.

12. The receiver as set forth in claim 11, wherein the first decoder detects two symbols s_1 and s_3 capable of minimizing an equation of $\left|R_1 - e^{j\theta_1} s_1\right|^2 + \left|R_3 - s_3\right|^2 + \left|R_{13} - e^{-j\theta_1} s_1^* s_3\right|^2 - |s_1|^2 |s_3|^2$ in which R_1, R_3 and R_{13} are given by:

$$R_1 = \left(\frac{r_1 h_1^* + r_2^* h_2 + r_3^* h_3 - r_4 h_4^*}{K}\right), R_3 = \left(\frac{r_1 h_4^* + r_2^* h_3 - r_3^* h_2 + r_4 h_1^*}{K}\right) \quad and \quad R_{13} = \left(\frac{-h_1 h_4^* + h_1^* h_4 - h_2^* h_3 + h_2 h_3^*}{K}\right)$$

and $K = |h_1|^2 + |h_2|^2 + |h_3|^2 + |h_4|^2$ where r_1, r_2, r_3 and r_4 denote the signals received during the four time intervals, and h_1, h_2, h_3 and h_4 denote the channel gains of four antennas.

13. The receiver as set forth in claim 11, wherein the second decoder detects two symbols s_2 and s_4 capable of minimizing an equation of $\left|R_2 - s_2\right|^2 + \left|R_4 - e^{j\theta_4} s_4\right|^2 + \left|R_{24} - s_2^* e^{j\theta_4} s_4\right|^2 - |s_2|^2 |s_4|^2$ in which R_2, R_4 and R_{24} are given by:

$$R_2 = \left(\frac{r_1 h_2^* - r_2^* h_1 + r_3^* h_4 + r_4 h_3^*}{K}\right), R_4 = \left(\frac{r_1 h_3^* - r_2^* h_4 - r_3^* h_1 - r_4 h_2^*}{K}\right) \quad and \quad R_{24} = \left(\frac{-h_2 h_3^* - h_1^* h_4 + h_4^* h_1 + h_3 h_2^*}{K}\right)$$

and $K = |h_1|^2 + |h_2|^2 + |h_3|^2 + |h_4|^2$ where r_1, r_2, r_3 and r_4 denote signals received during the four time intervals, and h_1, h_2, h_3 and h_4 denote the channel gains of four antennas.